Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US05/013826

International filing date: 21 April 2005 (21.04.2005)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/564,003
Filing date: 21 April 2004 (21.04.2004)

Date of receipt at the International Bureau: 26 May 2005 (26.05.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

1322657

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS; SHALL COME;

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

May 17, 2005

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM
THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK
OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT
APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE.

APPLICATION NUMBER: *60/564,003*
FILING DATE: *April 21, 2004*
RELATED PCT APPLICATION NUMBER: *PCT/US05/13826*

Certified by

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

PROVISIONAL APPLICATION FOR PATENT COVER SHEET
This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.	EV333441088US

INVENTOR(S)

Given Name (first and middle [if any]	Family Name or Surname	Residence (City and either State or Foreign Country)
Charles Marvin	Berteau	Plano, TX

Additional inventors are being named on the ___1___ separately numbered sheets attached hereto

TITLE OF THE INVENTION (500 characters max)

Restrictive and Preferential Routing in a Softswitch Environment with Media Gateway Clusters

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

[✔] Customer Number: 000027683

OR

[ ] Firm or Individual Name	
Address	Haynes and Boone, LLP
Address	901 Main Street, Suite 3100

City	Dallas	State	TX	Zip	75202
Country	USA	Telephone	972 7398638	Fax	214-200-0853

ENCLOSED APPLICATION PARTS (check all that apply)

[✔] Specification *Number of Pages* 20   [ ] CD(s), Number _____

[✔] Drawing(s) *Number of Sheets* incorporated into App   [✔] Other (specify) Return Postcard

[✔] Application Date Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

[✔] Applicant claims small entity status. See 37 CFR 1.27.

[✔] A check or money order is enclosed to cover the filing fees.

[ ] The Director is herby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 08-1394

[ ] Payment by credit card. Form PTO-2038 is attached.

FILING FEE
Amount ($)

80.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[✔] No.

[ ] Yes, the name of the U.S. Government agency and the Government contract number are: _____

[Page 1 of 2]

Respectfully submitted,

SIGNATURE _____

TYPED or PRINTED NAME Timothy F. Bliss

TELEPHONE 972 739-8638

Date April 21, 2004

REGISTRATION NO. 50,925
(if appropriate)
Docket Number: 29981.78

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

PROVISIONAL APPLICATION COVER SHEET
Additional Page

Docket Number	29981.78

INVENTOR(S)/APPLICANT(S)

Given Name (first and middle [if any]	Family or Surname	Residence (City and either State or Foreign Country)
Michael Seshagiri R.	Aguilar Madhavapeddy	Richardson, TX Richardson, TX

[Page 2 of 2]

Number _____ of _____

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	§	Attorney Docket No. 29981.78
Berteau, et al.	§	
	§	Customer No. 27683
Serial No. Unknown	§	
	§	Group Art Unit: Unknown
Filed: Herewith	§	
	§	Examiner: Unknown
For: Restrictive and Preferential Routing in a	§	
Softswitch Environment with Media Gateway	§	
Clusters	§	

EXPRESS MAIL CERTIFICATE

Mail Stop Provisional Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that the following attached papers and fee:
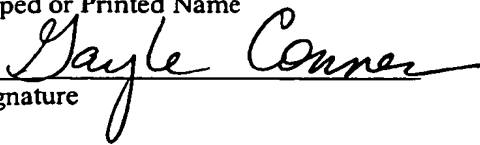
1. Provisional Application for Patent Cover Sheet (in duplicate);

2. Provisional Patent Application consisting of 20 pages of specification,

3. Drawing sheets, incorporated into the Application;

4. Application Data Sheet;

5. Check in the amount of $80.00; and

6. Return Postcard

are being deposited with United States Postal Service "Express Mail Post Office to Addressee" via

Express Mail Number: EV333441088US to the Commissioner for Patents, Box Provisional Patent

Application, Alexandria, VA 22313-1450, on the **21ˢᵗ day of April, 2004.**

Gayle Conner
Typed or Printed Name

Gayle Conner
Signature

RESTRICTIVE AND PREFERENTIAL ROUTING IN A SOFTSWITCH ENVIRONMENT WITH MEDIA GATEWAY CLUSTERS

Inventors: Charles Marvin Berteau
               8328 Barber Oak Drive
               Plano, Texas 75025
               Citizenship: USA
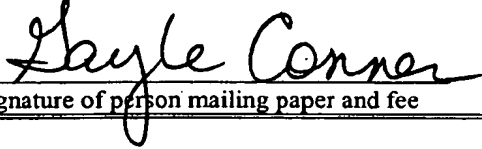
               Michael Aguilar
               2407 Aspen St.
               Richardson, TX 75082
               Citizenship: Philippines

               Seshagiri R. Madhavapeddy
               2521 Big Horn Lane
               Richardson, Texas 75080
               Citizenship: India

Assignee: Spatial Communication Technologies, Inc.
               1651 Glenville Drive, Suite 216
               Richardson, Texas 75080

HAYNES AND BOONE, LLP
901 Main Street, Suite 3100
Dallas, Texas 75202-3789
(214) 651-5000
Attorney Docket No. 29981.78
R-72837.1

RESTRICTIVE AND PREFERENTIAL ROUTING IN A SOFTSWITCH ENVIRONMENT WITH MEDIA GATEWAY CLUSTERS

WRITTEN DESCRIPTION

The present disclosure relates generally to voice and data communications and, more particularly, to a wireless system and method for implementing restrictive and preferential routing in a softswitch environment with media gateway clusters.

It is to be understood that the following disclosure provides many different embodiments, or examples, for implementing different features of the disclosure. Specific examples of components and arrangements are described below to simplify the present disclosure. These are, of course, merely examples and are not intended to be limiting. In addition, the present disclosure may repeat reference numerals and/or letters in the various examples. This repetition is for the purpose of simplicity and clarity and does not in itself dictate a relationship between the various embodiments and/or configurations discussed.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

1   Overview

This document describes exemplary specifications for Restrictive and Preferential Routing in a WMG Cluster with and without an interconnect[1] and addresses how the current routing mechanism in a D-MSC/G-MSC (e.g., a Spatial Atrium D-MSC/G-MSC) may be enhanced to efficiently route calls in such a case.

1.1 Current Routing Mechanism

A WSS may provide advanced capabilities to route calls efficiently. For example, it may provide CIC based, time based, originating party based, called party address based, trunk group based, etc., routing mechanisms for call route selections.

The following diagram depicts an exemplary Number Translations and Routing Mechanism.
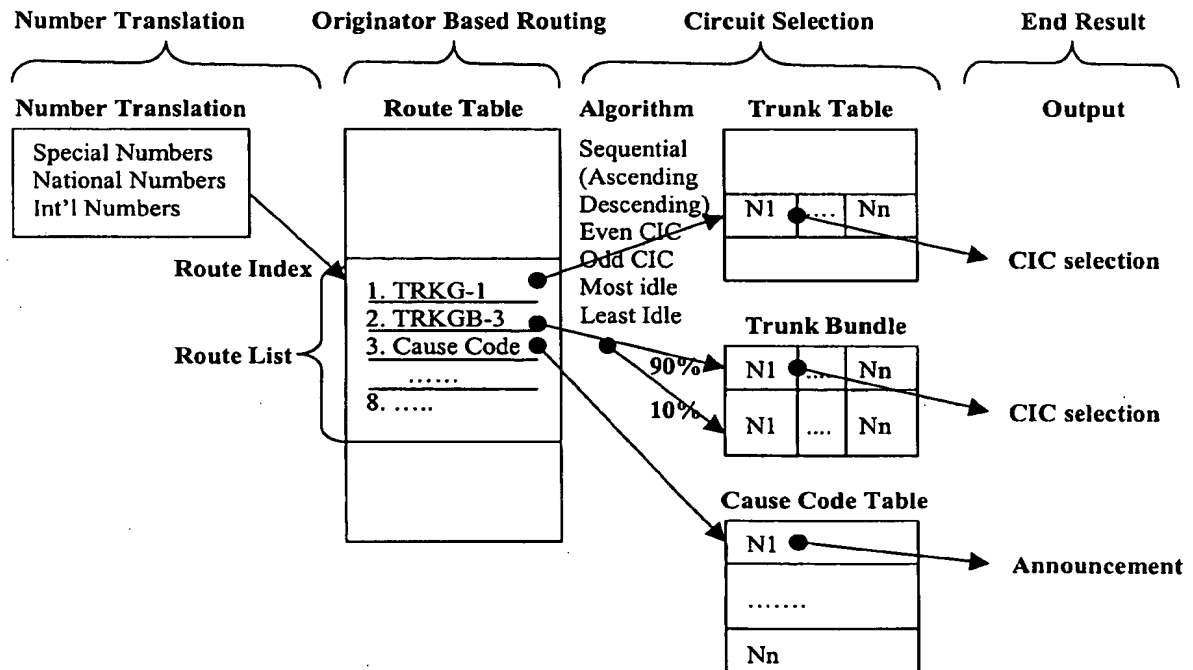
Figure 1: Number Translations and Routing Mechanism

However, the current routing mechanisms may provide no capability to assess the relative cost or availability of interconnect facilities in a WMG Cluster controlled by a WSS. As a result, in order to prevent the use of interconnect facilities that may not be present or optimize the use of interconnect facilities that are expensive, it may be necessary to treat routing for each WMG

---

[1] An interconnect could be an TDM, ATM or IP network

uniquely, especially if it is co-located with other WMGs in what the operator would otherwise consider to be a single switch location. Without special handling, interconnect facilities may need to be sufficient to cover random call distribution. This may be prohibitively expensive in a multi (e.g., 4) WMG cluster.

1.2 Exemplary Requirement

When WMGs are clustered in one location, the operator expects to treat the entire cluster as one single switch and hence expects only one set of routing translations. This requirement poses challenges in limiting or avoiding the use of an interconnect WMG cluster that are controlled by a WSS. This document describes each scenario involved with/without interconnect in WMG cluster and addresses their routing mechanisms

1.3 Solution Proposal

When there is no or limited interconnect available between WMGs, it is proposed to label each Trunk Group/Bundle in the Route List that is obtained through a route index and that the selection of circuit within a Trunk Group/Bundle (in the Route List) be based on the label. However, this label does not affect the progression through the route list. This solution maintains the current routing mechanism but adds a column called "Label" to the Route Table against each Trunk Group/Bundle.

Exemplary labels may be Restrictive, Preferential or None. The definitions of these labels are given below.

- **Restrictive Routing**
When there is no interconnect between WMGs, restricted routing forces a call to terminate on the same WMG where the call originated.
- **Preferential Routing**
When there is a limited interconnect between WMGs, preferential routing first tries to terminate a call on the same WMG where the call originated. If all the circuits on the same WMG are unavailable, then interconnect is used to connect to circuits connected to other WMG.
- **None**
No indication of Restrictive or Preferential routing. The default may perform circuit selection independent of WMG.

Consider the following example where Route-1 has the following route list

    TRKG-A   <Preferential>
    TRKG-B   <Restrictive>
    TRKG-C   <None>
    TRKG-D   <Preferential>

In this case, TRKG-A is tried first, not TRKG-B. But when TRKG-A is tried, it looks for its own WMG first, then the other. So, the selection is as follows

    A – own WMG
    A – other WMG
    B – own WMG

5

C – any
D – own WMG
D – other WMG

2 References and Applicable Standards

[1]   WMG Routing Call, The case for Restrictive and Preferential Trunk Selection: By
        Charles (Bert) Berteau

[2]   Change Request Form CR014 – PR778, Preferential Routing based on originating WMG:
        By Mike Aguilar

[3]   D-MSC Product Description Revision 6.2

2.1 Definitions & Abbreviations

CIC	Circuit Identification Code
DMSC	Distributed MSC
DPC	Destination Point Code
DN	Directory Number
FTN	Forward To Number
GMSC	Gateway MSC
OPC	Origination Point Code
TRKG	Trunk Group
TRKGB	Trunk Group Bundle
WMG	Wireless Media Gateway
WSS	Wireless Soft Switch

3 Scenario Description

The following section describes different exemplary network scenarios and their routing mechanisms, in addition to the details given in the "Case (B): Multiple MGWs, All in the same geographical location, an MGW cluster" in Reference [1].

3.1 Scenario 1: Multiple/Cluster WMGs, all in the same geographical location <u>without</u> an interconnect

Note: * - Set of circuits within a Trunk Group.
E.g. A1 and A2 are part of TRKG-A; and B1 and B2 are part of TRKG-B.
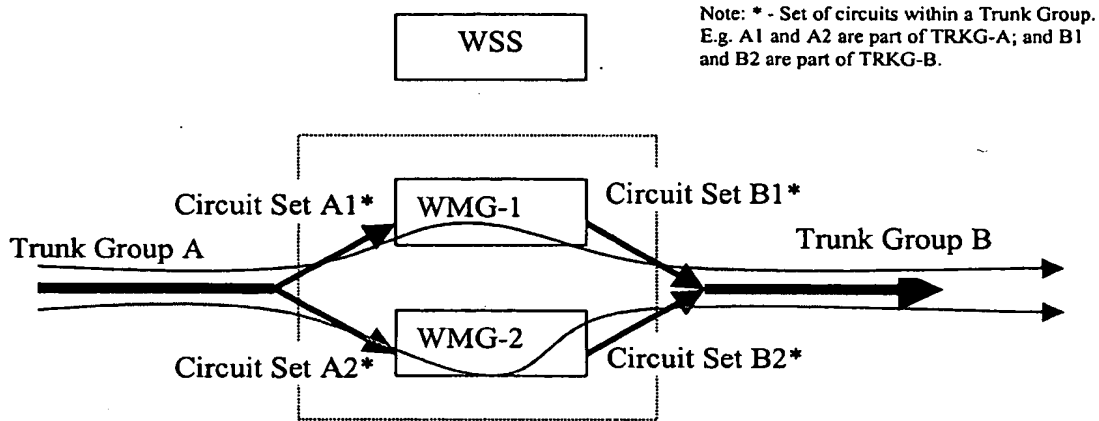
Figure 2: Trunk selection without an interconnect

A1 and A2 are not trunk groups but sets of circuits within Trunk Group-A that are connected to each of the two WMGs. Similarly, B1 and B2 are not trunk groups but sets of circuits within Trunk Group-B that are connected to each of the two WMGs.

Route List for Trunk Group-A:

Destination Trunk Group	Routing Mechanism[2]	Comments
Trunk Group–B	Restrictive	• If a call lands on WMG-1, then a circuit in Circuit Set-B1[3] within Trunk Group-B may be selected. • If a call lands on WMG-2, then a circuit in Circuit Set-B2 within Trunk Group-B may be selected • No other options are available here.

Table 1: Route List for Trunk Group-A without an interconnect

The above diagram and routing list assume that the calls are originating from Trunk Group-A and terminating on Trunk Group-B. However, in a real case, the traffic may be bi-directional, meaning that the calls can originate either from Trunk Group-A or Trunk Group-B and

---

[2] Newly proposed routing label
[3] It is a set of circuits within Trunk Group B.

terminate on Trunk Group-B or Trunk Group-A. In such a case, the routing table may also include the following route list.

Route List for Trunk Group-B:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group–A	Restrictive	• If a call lands on WMG-1, then a circuit in Circuit Set-A1 within Trunk Group-A may be selected. • If a call lands on WMG-2, then a circuit in Circuit Set-A2 within Trunk Group-A may be selected • No other options are available here.

Table 2: Route List for Trunk Group-A without an interconnect

3.2 Scenario 2: Multiple/Cluster WMGs, all in the same geographical location <u>with</u> an interconnect

In this scenario, there is an interconnect available between the two WMGs. Calls that land on WMG - A may preferentially be terminated on the same WMG-A. Similarly, calls that land on WMG-B may preferentially be terminated on the same WMG-B first. When these Preferential circuits are exhausted, then the interconnect between WMG-A and WMG-B may be used.
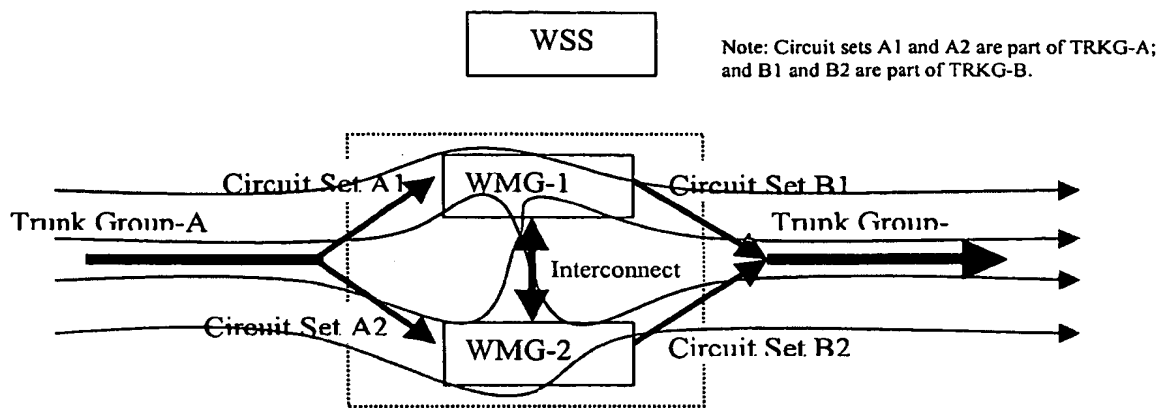
Figure 3: Trunk selection with an interconnect

Route List for Trunk Group-A:

Destination Trunk Group	Routing Mechanism[4]	Comments
Trunk Group–B	Preferential	• If a call lands on WMG-1, then a circuit in Circuit Set-B1 within Trunk Group-B may be selected. This means that the call may be terminated on the same WMG as it originated. If all the circuits in that Circuit Set-B1 are unavailable, then a circuit in Circuit Set-B2 may be selected via Interconnect and WMG-2. In other words, first try the same WMG, and then try the other WMG via Interconnect. • If a call lands on WMG-2, then a circuit in Circuit Set-B2 within Trunk Group-B may be selected. This means that the call may be terminated on the same WMG as it originated. If all the circuits in that Circuit Set-B2 are unavailable, then a circuit in Circuit Set-B1 may be selected via Interconnect and WMG-1. In other words, first try the same WMG, and then try the other WMG via Interconnect.

Table 3: Route List for Trunk Group-A with an interconnect

---

[4] Newly proposed routing label

9

Similarly, if Trunk Group–B were the originating trunk, then the route list would be as follows.

Route List for Trunk Group-B:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group–A	Preferential	• If a call lands on WMG-1, then a circuit in Circuit Set-A1 within Trunk Group-A may be selected. This means that the call may be terminated on the same WMG as it originated. If all the circuits in that Circuit Set-A1 are unavailable, then a circuit in Circuit Set-A2 may be selected via Interconnect and WMG-2. In other words, first try the same WMG, and then try the other WMG via Interconnect. • If a call lands on WMG-2, then a circuit in Circuit Set-A2 within Trunk Group-A may be selected. This means that the call may be terminated on the same WMG as it originated. If all the circuits in that Circuit Set–A2 are exhausted, then a circuit in Circuit Set-A1 may be selected via Interconnect and WMG-B. In other words, first try the same WMG, and then try the other WMG via Interconnect.

Table 4: Route List for Trunk Group-B with an interconnect

Please refer to the Number translations and routing mechanism diagram (Figure-1). The route list contains a maximum of eight entries that include Trunk Group, Trunk Group Bundle, Cause Code etc.; each entry has Type, Parameter and Out Pulse Index. The routing mechanism searches through this list in the sequential order. Note that if a trunk group needs to be selected first, then it may be placed first in the order, which can be done through EMS screen.

Though this trunk group ordering may help in a non-interconnect network scenario, it may not efficiently route the calls in an interconnect scenario as in the Scenario-2, where a route list entry can lead to multiple paths, one without an interconnect which is the most preferred and the rest with an interconnect. In the present example, there is no guarantee that the non-interconnect (same WMG) option would be utilized first and then an interconnect. Accordingly, a labeling mechanism may be used to guarantee the ordering of paths within a route entry.

3.3 Scenario 3: Multiple/Cluster WMGs, each in a different geographical location <u>without</u> an interconnect within a site or between sites

This scenario is similar to Scenario-1; however, the route list for Site-2 may be added to the routing table. For purposes of understanding, the route lists for this scenario are given separately. However, these route lists may be placed in one routing table on the WSS.

WSS

Note: A1 and A2 are part of TRKG-A; B1 and B2 are part of TRKG-B. Y1 and Y2 are part of TRKG-Y; and Z1 and Z2 are part of TRKG-Z

SITE 1

Circuit Set-A1 WMG-1 Circuit Set-B1
Trunk Group-A Trunk Group-B

Circuit Set-A2 WMG-2 Circuit Set-B2

SITE 2

Circuit Set-Y1 WMG-3 Circuit Set- Z1
Trunk Group-Y Trunk Group-Z

Circuit Set-Y2 WMG-4 Circuit Set-Z2
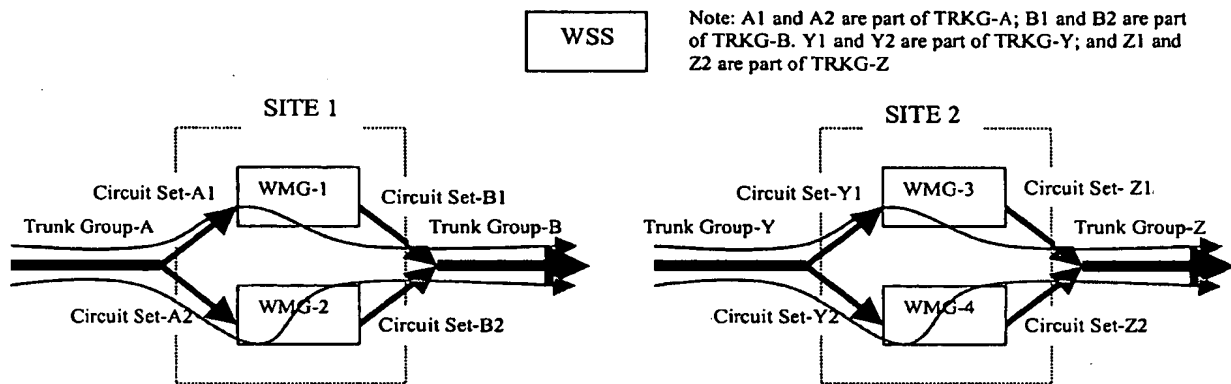
Figure 4: Trunk selection without an interconnect in a multi site WMG's cluster

Route Lists for Site-1:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group–B	Restrictive	• If a call lands on WMG-1, then a circuit in Circuit Set-B1 within Trunk Group-B may be selected. • If a call lands on WMG-2, then a circuit in Circuit Set-B2 within Trunk Group-B may be selected • No other options are available here.
Trunk Group–A	Restrictive	• If a call lands on WMG-1, then a circuit in Circuit Set-A1 within Trunk Group-A may be selected. • If a call lands on WMG-2, then a circuit in Circuit Set-A2 within Trunk Group-A may be selected • No other options are available here.

Table 5: Route Lists for Site-1 without an interconnect

Similarly, for the Site-2, the route list is as follows

Route Lists for Site-2:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group–Z	Restrictive	• If a call lands on WMG-3, then a circuit in Circuit Set-Z1 within Trunk Group-Z may be selected. • If a call lands on WMG-4, then a circuit in Circuit Set-Z2 within Trunk Group-Z may be selected • No other options are available here.
Trunk Group–Y	Restrictive	• If a call lands on WMG-3, then a circuit in Circuit Set-Y1 within Trunk Group-Y may be selected. • If a call lands on WMG-4, then a circuit in Circuit Set-Y2 within Trunk Group-Y may be selected • No other options are available here.

Table 6: Route Lists for Site-2 without an interconnect

3.4 Scenario 4: Multiple/Cluster WMGs, each in a different geographical location *with* an interconnect within a site and between sites
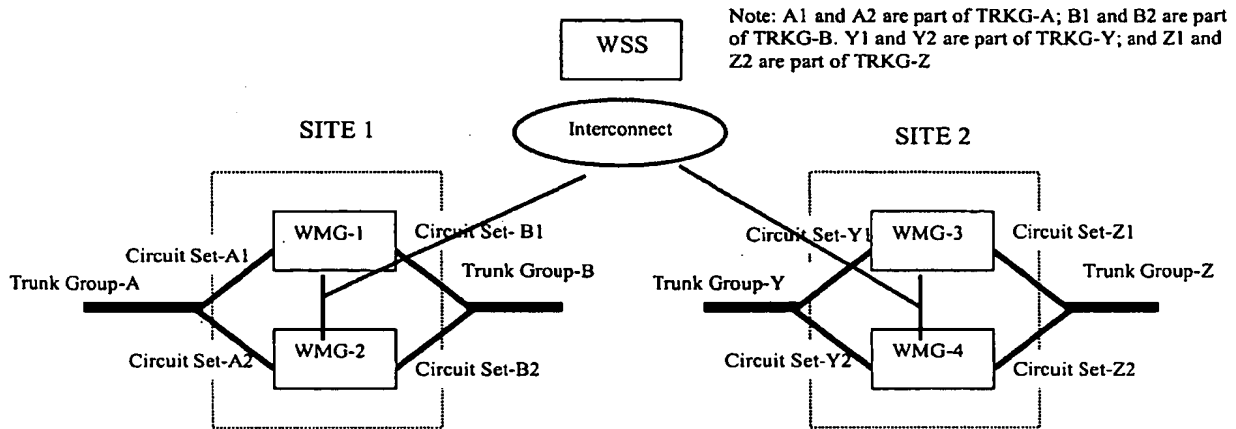
Figure 5: Trunk selection with an interconnect in a multi site WMG's cluster

In this scenario, there is a limited interconnect available among the WMGs to form a cluster. The following is the Route List for Trunk Group-A as the originating trunk group with B, Y and Z as the terminating trunk groups. Route Lists for B, Y and Z as the origination trunk can be constructed similar to the following route lists.

Route List for Trunk Group-A in Site-1:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group – B	Preferential	• If a call lands on WMG-1, then a circuit on Circuit Set-B1 within Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B1 are unavailable, then Circuit Set-B2 may be selected via Interconnect and WMG-2. In other words, first try the same WMG, and then try the other WMGs via Interconnect. • If a call lands on WMG-2, then a circuit on Circuit Set-B2 within Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B2 are unavailable, then Circuit Set-B1 may be selected via Interconnect and WMG-1. In other words, first try the same WMG, and then try the other WMGs via Interconnect.
Trunk Group – Y	None	• Here the call may be routed through the Interconnect available.
Trunk Group – Z	None	• Here the call may be routed through the Interconnect available.

Table 7: Route Lists for Trunk Group-A to terminate calls on B, Y and Z with an interconnect

Note that the order of trunk groups in the above route list can be changed to TRKG-Y, TRKG-Z and TRKG-B, with TRKG-B still carrying the Preferential routing mechanism.

3.5 Scenario 5: Multiple/Cluster WMGs within a geographical location with an interconnect

Figure 6: Trunk selection with an interconnect in a multi site WMG's cluster

In this scenario, there is a limited interconnect available among the WMGs to form a cluster. The incoming circuits are split and distributed among the WMGs equally. All the WMGs are connected to four different outgoing Trunk Groups (Trunk Group-B being Preferential, Trunk Group-C being Restrictive, Trunk Group-D being none, and Trunk Group-E being Preferential). The following are the Route Lists for Trunk Group-A as the originating trunk group with B, C, D and E as the terminating trunk groups.

Route List for Trunk Group-A:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group–B	Preferential	o If a call lands on WMG-1, then a circuit on Circuit Set-B1 in Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B1 are unavailable, then an Interconnect is used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect. o If a call lands on WMG-2, then a circuit on Circuit Set-B2 in Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B2 are unavailable, then an Interconnect is used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect. o If a call lands on WMG-3, then a circuit on Circuit Set-B3 in Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B3 are

14

		unavailable, then an Interconnect is used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect. o If a call lands on WMG-4, then a circuit on Circuit Set-B4 in Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B4 are unavailable, then an Interconnect is used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect.
Trunk Group-C	Restrictive	o If a call lands on a particular WMG, then the call needs to be terminated on the same WMG to reach the Destination-G. o No other options are available here.
Trunk Group-D	None	o Call can be terminated on any WMG via Interconnect to reach Trunk Group-C.
Trunk Group-E	Preferential	o If a call lands on WMG-1, then a circuit on Circuit Set-E1 in Trunk Group-E may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-E1 are unavailable, then Interconnect is used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect. o If a call lands on WMG-2, then a circuit on Circuit Set-E2 in Trunk Group-E may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-E2 are unavailable, then an Interconnect is used to reach Trunk Group-E. In other words, first try the same WMG, and then try the other WMGs via Interconnect. o If a call lands on WMG-3, then a circuit on Circuit Set-E3 in Trunk Group-E may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-E3 are unavailable, then an Interconnect is used to reach Trunk Group-E. In other words, first try the same WMG, and then try the other WMGs via Interconnect. o If a call lands on WMG-4, then a circuit on Circuit Set-E4 in Trunk Group-E may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-E4 are unavailable, then Interconnect is used to reach Trunk Group-E. In other words, first try the same WMG, and then try the other WMGs via Interconnect.

Table 8: Route List for Trunk Group-A terminating on B, C, D and E with an interconnect

3.6 Scenario 6: Multiple/Cluster WMGs, each in a different geographical location *with* a limited interconnect within a site and between sites
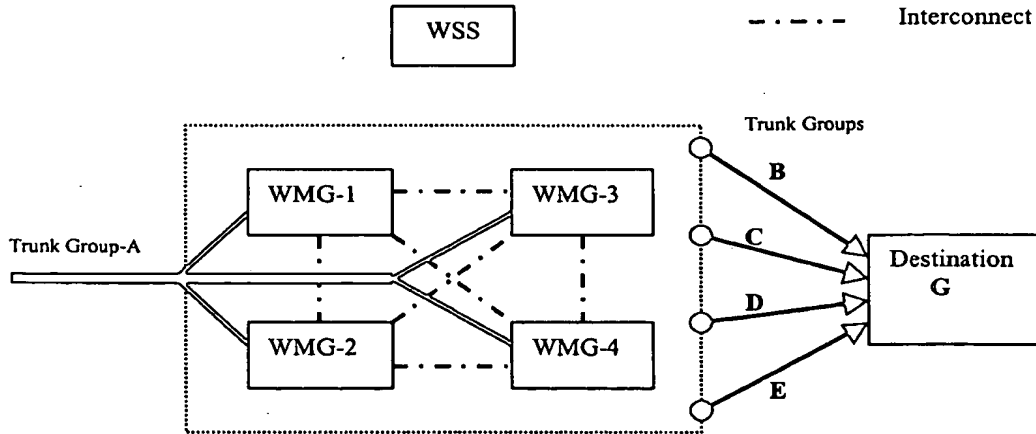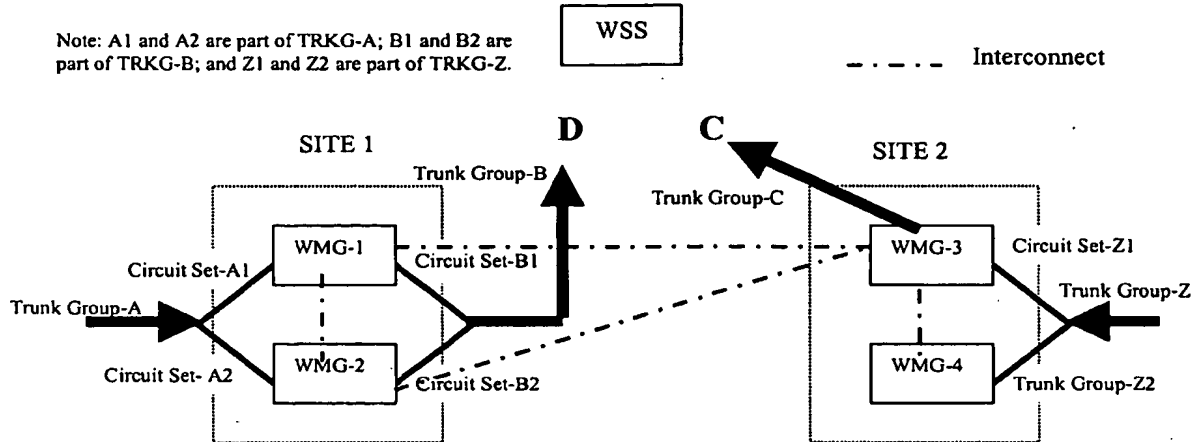

Figure 7: Trunk selection with an interconnect in a multi site WMG's cluster

In this scenario, there is a limited interconnect available among the WMGs to form a cluster. The following are the Route Lists for Trunk Group-A as the originating trunk group with B and C as the terminating trunk groups. Route Lists for B and C as the originating trunk groups can be constructed similar to the following route lists.

Route Lists for Trunk Group-A to reach Trunk Groups B and C:

Destination Trunk Group	Routing Mechanism	Comments
Trunk Group – B	Preferential	• If a call lands on WMG-1, then a circuit on Circuit Set-B1 within Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the circuits in that Circuit Set-B1 are unavailable, then an Interconnect can be used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect. • If a call lands on WMG-2, then a circuit on Circuit Set-B2 within Trunk Group-B may be selected. This means that the call may be terminated on the same WMG where it originated. If all the trunks in that Circuit Set-B2 are unavailable, then an Interconnect can be used to reach Trunk Group-B. In other words, first try the same WMG, and then try the other WMGs via Interconnect.
Trunk Group – C	None	• Call can be terminated on any WMG via Interconnect to reach Trunk Group-C.

Table 9: Route Lists for Trunk Group-A to terminate calls on B and C with an interconnect

16

4 Exemplary Requirements

4.1 Route List Changes

The scenarios discussed in the previous section highlight two important characteristics to restrictive and preferential routing: (a) the restrictive versus preferential decision may not be switch-wide, because some WMG clusters might have interconnect facilities (preferential routing case), whilst others have none at all (restrictive case); and (b) the decision as to whether or not to preferentially select facilities on the same WMG may not be made on a route list basis, but rather on a per-trunk group basis (e.g. routes within route list).

Accordingly, in one example, the proposed change is only on the Trunk Groups/Bundles in the Route List (and not in the Number Translations or Circuit Selection Algorithm). The current data structure of an entry in the Route List is as follows

```
TYPE1                    TINYINT NOT NULL
PARAMETER1               INTEGER NOT NULL
OUTPULSEINDEX1           SMALLINT NOT NULL
```

The above data structure may include the proposed "LABEL" as an additional field as given below.

```
TYPE1                    TINYINT NOT NULL
PARAMETER1               INTEGER NOT NULL
OUTPULSEINDEX1           SMALLINT NOT NULL
LABEL
```

The LABEL field may be a small integer but not null. Exemplary possible values and priorities for the LABEL field are as follows.

LABEL Value	Routing Mechanism	Comments
1	Restrictive	
2	Preferential	Preferential label can act as an indicator to the software to terminate calls on the same WMG first and if all the circuits on the same WMG are unavailable, then the calls may be terminated via an Interconnect. Without this indicator, there is no mechanism for software to make the distinction and hence the routing mechanism may not be very efficient.
3	None	This is the default routing mechanism if Restrictive or Preferential is not selected

Table 10: Label values, routing mechanisms and priorities

5 Operational Aspects

5.1 Provisioning and Non-Blocking

- To benefit from Restrictive and Preferential routing, the incoming trunk group to a cluster may have circuits spread (proportionately to total ports) across all WMGs in the cluster.
- When the routes are configured on the EMS screen during provisioning, the routing mechanism (LABEL) list may be displayed to select Restrictive, Preferential or None. "None" may be used as the default if Restrictive or Preferential is not selected.

5.2 Capacity

- The proposed change may not make changes outside of a certain scope to the route list data structure and may not add more data so that there is a limitation on the cache where the route table resides.

5.3 Availability & Redundancy

- The change may not hinder the availability or the geographical redundancy of the system in anyway.
- In the case of fail over, the route list may be recovered or duplicated onto a healthy system.

5.4 Billing

- The selected route with the proposed change may be collected for analysis purposes (e.g., in case this information is significant to the Network/Service Provider for billing/tariff purposes).

5.5 Reliability and Complexity

- The system may meet certain reliably standards to route the calls efficiently in a cluster of WMGs.
- The routing mechanism may be simple and limited to Route list and call processing module.

5.6 Statistics

- Selection of the route may be collected for statistics purpose (e.g., in case this info is significant to the Network/Service Provider for Network Usage Management purposes).
- The statistics may be collected and displayed on the appropriate EMS screen

5.7 Performance

- The design and implementation may make sure that the response time for circuit selection for all cases (Restrictive and Preferential) are comparable to current circuit selection times.
- Route selections may be made efficiently so as to terminate a call on the same WMG, where the call was originated. If all the circuits on the same WMG are unavailable, then an interconnect may selected.

- The change may not significantly increase the call establishment time involving a WMG cluster
- A generic routing mechanism that can satisfy various network topologies efficiently may be developed.
- The system performance may be reduced or seriously impacted due to the various additions involved in the change.
- The logging and trace of the proposed change may be an overhead and impact the performance of the normal operation of the system.

Accordingly, while the disclosure has been particularly shown and described with reference to specific examples, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the disclosure. It is understood that several modifications, changes and substitutions are intended in the foregoing disclosure and in some instances some features of the disclosure will be employed without a corresponding use of other features. For example, various steps in the above described methods may be combined, further divided, or eliminated entirely. Furthermore, steps may be performed in any order, and steps described with respect to different methods may be combined into a single method. In addition, data flows other than those illustrated may be used to provide identical or similar functionally. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the scope of the disclosure.

WHAT IS CLAIMED IS:

  1. A system and method for implementing restrictive and preferential routing in a softswitch environment with media gateway clusters substantially as herein described and illustrated in the accompanying drawings.

Application Data Sheet

Application Information

Application Type::	Provisional
Title::	RESTRICTIVE AND PREFERENTIAL ROUTING IN A SOFTSWITCH ENVIRONMENT WITH MEDIA GATEWAY CLUSTERS
Attorney Docket Number::	29981.78
Request for Early Publication?::	No
Request for Non-Publication?::	No
Small Entity::	Yes
Petition Included?::	No
Secrecy Order in Parent App.?::	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	US
Status::	Full Capacity
Given Name::	Charles
Middle Name::	Marvin
Family Name::	Berteau
City of Residence::	Plano
State or Province of Residence::	TX
Country of Residence::	US
Street of Mailing Address::	8328 Barber Oak Drive
City of Mailing Address::	Plano
State or Province of Mailing Address::	TX
Country of Mailing Address::	US
Postal or Zip Code of Mailing Address::	75025

Applicant Authority Type::	Inventor
Primary Citizenship Country::	Philippines
Status::	Full Capacity

Given Name::	Michael
Family Name::	Aguilar
City of Residence::	Richardson
State or Province of Residence::	TX
Country of Residence::	US
Street of Mailing Address::	2407 Aspen St.
City of Mailing Address::	Richardson
State or Province of Mailing Address::	TX
Country of Mailing Address::	US
Postal or Zip Code of Mailing Address::	75082

Applicant Authority Type::	Inventor
Primary Citizenship Country::	India
Status::	Full Capacity
Given Name::	Seshagiri
Middle Name::	R.
Family Name::	Madhavapeddy
City of Residence::	Richardson
State or Province of Residence::	TX
Country of Residence::	US
Street of Mailing Address::	2521 Big Horn Lane
City of Mailing Address::	Richardson
State or Province of Mailing Address::	TX
Country of Mailing Address::	US
Postal or Zip Code of Mailing Address::	75080

Correspondence Information

Correspondence Customer Number::	27683
Phone Number::	972 739-8638
Fax Number::	214.200.0853
E-Mail Address::	ipdocketing@haynesboone.com

Representative Information

Representative Customer Number::	27683

Assignee Information

Assignee Name::   Spatial Communication Technologies, Inc.

Street of Mailing Address::   1651 Glenville Drive, Suite 216

City of Mailing Address: Richardson

State or Province of Mailing Address::   TX

Country of Mailing Address::   USA

Postal or Zip Code of Mailing Address::   75080

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

SMITH, Jessica, W.
Alcatel Wireless, Inc.
3400 W. Plano Parkway, M/S LEGL2
Plano, TX 75075
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)*
20 June 2005 (20.06.2005)

Applicant's or agent's file reference	
139381WO	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*
PCT/US2005/013826	**21 April 2005 (21.04.2005)**

International publication date *(day/month/year)*	Priority date *(day/month/year)*
	21 April 2004 (21.04.2004)

Applicant
ALCATEL WIRELESS, INC. et al

1. By means of this Form, which replaces any previously issued notification concerning submission or transmittal of priority documents, the applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to a date of receipt, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).

2. *(If applicable)* The letters **"NR"** appearing in the right-hand column denote **a priority document which, on the date of mailing of this Form, had not yet been received by the International Bureau** under Rule 17.1(a) or (b). Where, under Rule 17.1(a), the priority document must be submitted by the applicant to the receiving Office or the International Bureau, but the applicant fails to submit the priority document within the applicable time limit under that Rule, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

3. *(If applicable)*An asterisk (*) appearing next to a date of receipt, in the right-hand column, denotes **a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b)** (the priority document was received after the time limit prescribed in Rule 17.1(a) or the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b)). Even though the priority document was not furnished in compliance with Rule 17.1(a) or (b), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
21 April 2004 (21.04.2004)	60/564,003	US	26 May 2005 (26.05.2005)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer **Carole Villet**
Facsimile No. +41 22 338 82 70	Facsimile No. (41-22) 338.70.80 Telephone No. +41 22 338 8227